

BURST et al., Ser. No. 10/041,558

### REMARKS

Claims 1, 3 and 6-15 are pending. Applicants have added the limitations of previous claims 2 and 5 into claim 1.

Regarding the IDS, the Examiner indicated that applicants have not included a concise explanation of the relevance of the Chinese reference submitted therewith. Applicants note, however, that a complete translation of that reference was included with the IDS. It appears that the English translation was scanned into PAIR as pages 8-15 of the "foreign reference" listed in the Image File Wrapper. Accordingly, applicants request consideration hereof.

Applicants have amended the specification as the Examiner has suggested.

Claims 11-15 stand rejected under 35 U.S.C. 112, second paragraph, as being indefinite. Applicants have amended claim 11 to recite proper antecedent bases with respect to claim 1.

Claims 1-10 stand rejected under 35 U.S.C. 103(a) as being unpatentable over Miller et al. (US 6,458,249). Applicants respectfully traverse this rejection.

Miller et al. is based on the object to separate a mixture of perfluorinated compounds, such as e.g.  $\text{NF}_3$  and PFC-14. This is achieved by a process where this mixture, which may form an azeotropic or azeotrope-like composition, is supplied with an entraining agent, such as HCl. HCl and PFC-14 form an azeotropic or azeotrope-like composition having the lowest boiling point temperature at any given pressure of either the pure components or the azeotropic compositions comprising HCl and e.g.  $\text{NF}_3$ . This azeotropic composition is distilled overhead from the column and  $\text{NF}_3$  depleted of PFC-14 is obtained as a bottom product (see examples). Therefore, the claimed process differs from the process of Miller et al. not only by the features enumerated by the examiner, i.e. in applicants' case (1) the formation of two azeotropic mixtures AH and BH (Miller: one azeotrope), (2) both having a boiling point lower than the boiling point

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of the azeotropic auxiliary, but also (3) by the fact that this document does not mention the appearance of a ternary azeotrope ABH and problems connected therewith.

Advantageously, the present invention provides a process which allows separation of a mixture containing components A and B, although they might form together with auxiliary H a ternary azeotrope ABH (see page 4, lines 7-9 of the description). This is achieved by introducing at least part of the auxiliary H above the point of introduction of the mixture to be separated. The vapor rising through the column and the descending auxiliary are in this way conveyed in counter-current. This leads to at least partial extraction of the higher boiling component A or B, which reduces or prevents the formation of a ternary azeotrope ABH having a boiling point lower than that of the binary azeotropes AH and BH. Applicants note that the occurrence of said ternary azeotrope ABH would adversely affect the success of the separation of A and B (see page 5, lines 22-33). Since neither the possible occurrence of ternary azeotropes ABH nor the problem connected therewith are mentioned in Miller et al., this reference could not give the slightest hint how to solve this problem. Therefore, the claimed process is not obvious over Miller et al.

The same arguments apply in view of CN 1035507. This document describes a process wherein a mixture of butyl chloride, butanol, water and a small amount of dibutyl ether is distilled. A mixture of butyl chloride, water and dibutyl ether is obtained at the top of the column and is further subjected to several separation processes, while butanol and acidic water are obtained at the bottom of the column and are also subjected to further separation steps. The occurrence of a ternary azeotrope and problems connected therewith are not mentioned.